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in the spring. The maximum for carbohydrate reserves for deciduous trees appears to be at the period of leaf-fall, while that for evergreens is at the opening of buds in the spring. There seems to be insufficient evidence that cellulose acts as a winter reserve.—GEO. D. FULLER.

Lens cells in plants.—The position of the investigators who contend that the lens cells occurring in the epidermis of various plants are not essentially organs of light perception will be strengthened by the results of SUMMERS,⁴⁵ for in the plants studied phototropic movement occurred only before the development of the lenslike cells. The plant studied is a native of Cape Colony, Africa, where it grows under conditions of intense insolation. The character of the epidermis changes with the age of the leaves, which, at the time the lens cells differentiate, are quite rigid. An incrustation of calcium oxalate is found upon the epidermis, and this, we are assured, functions as a protection when solar illumination becomes too strong for the plant.—GEO. D. FULLER.

Embryo sac and embryo of *Garcinia*.—A series of investigations on the embryo sac and embryo of angiosperms, by the late Dr. TREUB, has begun to appear,⁴⁶ the first paper dealing with two species of *Garcinia* (Guttiferae), *G. Kydia*, and *G. Treubii*. The details of embryo sac formation are described and illustrated, the variations being of minor importance and all referable to categories recorded among angiosperms. The most noteworthy statement is that in reference to the evidence for parthenogenesis, which may be said to be suspected rather than proved. The paper adds another angiospermous genus to those that have been investigated, and still further emphasizes the remarkable uniformity of this great group in its essential morphology.—J. M. C.

Nuclear extrusion among Fucaceae.—GARDNER⁴⁷ has experimented on the nuclear extrusion of six different forms of Fucaceae: *Fucus evanescens* f. *typicus* Kjellm., *Hesperophycus Harveyanus* Setchell and Gardner, *Pelvetiopsis limita* Gardner f. *typica* and f. *lata*, *Pelvetia fastigiata* Décne, and *Cystosira Osmundacea* Ag. Many irregularities were noted; for example, in the case of *Hesperophycus* the contents of the oogonium finally divided into two eggs, one of which included a single nucleus and the other seven nuclei; the fate of the eggs after escape from the oogonium was not followed. In the case of *Pelvetia*, the six extra nuclei are cast out between the eggs instead of on the surface.—S. YAMANOCHI.

⁴⁵ SUMMERS, F., On the occurrence of lens cells in the epidermis of *Mesembryanthemum pseudotruncatellum*. Ann. Botany **25**:1137-1145. 1911.

⁴⁶ TREUB, M., Le sac embryonnaire et l'embryon dans les angiospermes. I. *Garcinia Kydia* Roxb., *Garcinia Treubii* Pierre. Ann. Jard. Bot. Buitenzorg **24**:1-17. pls. 1-5. 1911.

⁴⁷ GARDNER, NATHANIEL LYON, Variations in nuclear extrusion among Fucaceae. Univ. Calif. Publ. Bot. **4**:121-136. pls. 16, 17. 1910.